SECTION 9-06, STRUCTURAL STEEL AND RELATED MATERIALS
August 3, 2009

9-06.5(3) High Strength Bolts

Paragraphs one through four are revised to read as follows:

High-strength bolts for structural steel joints shall conform to either AASHTO M 164 Type 1 or 3, or AASHTO M 253 Type 1 or 3, as specified in the Plans or Special Provisions.

Galvanized AASHTO M 164 Type 1 bolts with an ultimate tensile strength above 145 ksi shall be tested for embrittlement. Embrittlement testing shall be conducted after galvanization in accordance with ASTM F 606, Section 7. The Manufacturer's Certificate of Compliance for the lot provided shall show the ultimate tensile strength test results.

Bolts conforming to AASHTO M 253 shall not be galvanized. AASHTO M 253 Type 1 bolts shall be painted with two coats of paint, conforming to Section 9-08.1(2)B, with a minimum dry film thickness of 2 mils per coat, when specified in the Plans or Special Provisions.

Bolts for unpainted and nongalvanized structures shall conform to either AASHTO M 164 Type 3 or AASHTO M 253 Type 3, as specified in the Plans or Special Provisions.

Nuts for high strength bolts shall meet the following requirements:

AASHTO M 164 Bolts	
Black Type 1	AASHTO M 291 Grade C, C3, DH and DH3
	AASHTO M 292 Grade 2H
Black weathering Type 3	AASHTO M 291 Grade C3 and DH3
Galvanized Type 1	AASHTO M 291 Grade DH
	AASHTO M 292 Grade 2H
AASHTO M 253 Bolts	
Black Type 1	AASHTO M 291 Grade DH, DH3
	AASHTO M 292 Grade 2H
Black weathering Type 3	AASHTO M 291 Grade DH3

9-06.13 Copper Seals

This section including title is revised to read:

9-06.13 Vacant

9-06.16 Roadside Sign Structures

This section is revised to read:

All bolts, nuts, washers, cap screws, and coupling bolts shall conform to AASHTO M 164 and Section 9-06.5(3). All connecting hardware shall be galvanized after fabrication in accordance with AASHTO M 232.

Posts for single post sign structures shall meet the requirements of ASTM A 500 Grade B or ASTM A 53 Grade B, Type E or S.

Posts for perforated square steel posts shall meet the requirements of ASTM A 653 Grade 50. Perforated square steel posts shall be finished in accordance ASTM A 653 G90 Structural Quality Grade 50 or ASTM A 653 G140.

Slip bases (SB1, SB2, and SB3) for perforated square steel posts shall conform to the following:

Plates	ASTM A 572
Casting (SB3)	ASTM A 536 Grade 65-45-12 and ASTM A 153
Tubing	ASTM A 500 Grade B
Angle Iron (SB1)	ASTM A 36

Except as noted otherwise, the slip bases (SB1, SB2, and SB3) for perforated square steel posts shall be hot dipped galvanized.

The heavy duty anchor used for perforated square steel posts (ST-4) shall meet the requirements of ASTM A 500 Grade B and shall be hot dipped galvanized.

Wide flange steel or solid square steel posts for multiple post sign structures shall conform to either ASTM A 36 or ASTM A 992. Posts conforming to either ASTM A 588 or ASTM A 572 Grade 50 may be used as an acceptable alternate to the ASTM A 36 and ASTM A 992 posts. All steel not otherwise specified shall conform to either ASTM A 36 or ASTM A 992.

Except as noted otherwise all steel, including posts, base plates, and base stiffeners, shall be galvanized after fabrication in accordance with AASHTO M111.

Base connectors for multiple directional steel breakaway posts shall conform to the following:

Brackets	Aluminum Alloy 6061 T-6
Bosses for Type TPB Brackets	ASTM A 582
Anchor Ferrules	Type 304 stainless steel for threaded portion. AISI 1045 steel rod and AISI 1008 coil for cage portion.

Anchor couplings for multiple directional steel breakaway posts shall conform to AMS 6378D with a tensile breaking strength range as follows:

Type TPA	17,000 to 21,000 lb.
Type TPB	47,000 to 57,000 lb.

For multi-directional breakaway base connectors, shims shall conform to ASTM A 653, SS Grade 33, Coating Designation G 165.